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Articoli/*Articles*

TRANSMISSION OF CLASSICAL MEDICAL TEXTS THROUGH LANGUAGES OF THE MIDDLE-EAST

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SUMMARY

CLASSICAL MEDICAL TEXTS THROUGH LANGUAGES OF THE MIDDLE-EAST

Classical texts, i.e. Greek treatises on medicine, reached Western Europe during the Middle-Ages by few ways, mainly either directly from the Hellenistic world, or indirectly through versions in the languages of the Middle-East, especially [Syriac]-Arabic. The comparison between Greek manuscripts and translations may be useful for both correction and interpretation of texts.

An extraordinary case may arise when the original Greek treatise is lost and only the Arabic version is available. This is the case of a Commentarium *of Galen on the Hippocratic* De äere aquis et locis*: the treatise has recently been found in a manuscript (*Tal'at, tibb 550*) at the National Library, Cairo, and is the work of translators of the school of Hunayn ibn Ishâq (9th century), the Nestorian physician who had a skilled philological method of reconstruction of original Greek texts. Other relevant ways of transmission (Byzantine area-Spain mainly at the time of the Emperor Constantine VII Porphyrogenete, Arabian Africa-Salernum with Constantine the African) played an important role in the recovery of Classical Medicine in the Western World, through both Arabic-Muslim and Arabic-Hebrew physicians.*

Parole chiave/*key words*: Classical Medicine - Syriac Arabic translations
Arabian Spain - Salernum School

Introduction

The way in which classical medicine and related works survived into the Middle-Ages is still under investigation: in fact, the *codices vetusti*, dating IX-X century A.D. and derived from archaic texts, and fragments may be interpreted regarding the original text and meaning not only by philological analysis of the texts of these *codices* in the original Greek language, but also by a comparison with classical thought, which has been transmitted in other languages. Thus, current studies on the late classical history of medicine focus not only on the study of codices, but also on the *lateral way* of transmission of classical works: this has been done either directly in Greek through the *scriptoria*, mainly of the Constantinopolitan area and Alexandria, or through the languages of the Middle-East, i.e. Armenian, Georgian, Syriac, Arabic, Hebrew, Coptic. Again, the recovery of Greek medical thought in Western Europe has been made possible also by translations from Arabic to Latin, i.e. by Constantine the African, who was active in Salernum and Montecassino during the 11th Century. In these fields the Chairs of Roman and Greek History of the University of Rome La Sapienza have organized an international study group since 1983, which each year discusses various aspects of the problem and particularly those regarding:

i. the recovery of a lost Greek text through the transmission of the same text into languages of the Middle-East;
ii. the critical editing of original Greek works by comparing the transmitted Greek text with those transmitted into languages of the Middle-East;
iii. the analysis of classical thought during the various steps of transmission Greek-Syriac-Arabic-[Hebrew]-Latin.

Actually, we may ask if the possibility to have a large number of manuscripts by the main *lateral route* of transmission, i.e. Arabic, is useful in the study of original texts and their meaning, e.g. the texts and ideas of Galen, who was very widely translated in the Arabian world. Thus, in recent years, the above mentioned group has dedicated more attention to the transmission of medical classical texts, e.g. works attributed to the Hippocratic School, Galen or Dioscorides[1].

The general accuracy of translation and faithfulness to the original text is indispensable in studying the genuine meaning by the *lateral route* of transmission: a rigorous philological method followed by the translators may render the text useful for comparison with the original. If a direct testimony of this accuracy is available, the discussion may be focused on the interpretation of the text as well as on the corruptions, interpolations or deletions, which may be present due to the transmission or transliteration (from Uncial to minuscule) or external influences (i.e. deletion of a passage which is against the prevailing doctrine). In this field, a significant role is played by the Syriac-Arabic transmission of texts of Greek medicine. The principal steps of this process may be summarized as follows:

i. 6th century: expulsions of Nestorians from Constantinople and closing of the Academy of Athens - spreading of philosophical, scientific and medical knowledge to the Middle-East (e.g. Gundishâpâr); decline of classical ideas in the Roman Empire;
ii. 8th-9th century - Costantinopolitan area: scientific-cultural ferments, with reissue of Uncial Codices of secular content (*Parisinus suppl. gr.* 1362, Aristotle, *Sophistici elenchi*; *Parisinus gr.* 2179 Dioscorides, *De materia medica*; *Parisinus gr.* 2389 Ptolemy, *Syntaxis mathematica*; *Vaticanus gr.* 1291, Ptolemy's Astronomical Tables);
iii. 9th-10th century - Costantinopolitan area: transliteration from Uncial to minuscule writing; Caliphate of Baghdad: rise of a great interest in classical culture, including philosophy and medicine and transmission from Greek-Syriac-Arabic of works of classical authors, e.g. Aristotle, Hippocrates, Galen and Dioscorides;

iv. 10th-11th century - Constantinopolitan area: Byzantine Renaissance; Arab dominions: religious tolerance and spreading of classical culture in Arabic texts (Cairo, Spain); reissued classical medical works by skilled physicians in Baghdad, Cairo and Spain; Salernum: School of medicine with practical aim (with poor knowledge of classics);
v. 12th century - Arabian dominions: Spain: religious intolerance against Arabian-Jews and their moving to France (Montpellier) and Italy (Salernum); North-Africa: Constantine the African (*Constantinus Africanus*) moves to Salernum and Monte Cassino with classical works in Arabic that he translated into Latin.

Transmission of Greek culture in the Middle-East

It should be remembered that the Middle-East world had contacts with Greek culture, including medicine, and great advances were made in the study of the Classics, e.g. by the School of Nîsibi, which was devoted to Hellenistic studies, with its Academy of philosophy and sciences. So, a new impulse had been given by two facts. When the Patriarch Nestorius for his heresy had been condemned and deposed (after the Council of Ephesus, 431 A.D), then expelled from Constantinople, Nestorius was banished to Upper Egypt and the Nestorians went to the Middle-East and traces of their medical activity may be found in Mesopotamia and in Sassanian Persia (Gundishâpâr, in Khuzistan, where a hospital was established, in the 5th century A.D.). Again, when Justinian closed the Academy of Athens (529 A.D.) Greek philosophers also went to Gundishâpâr, which consequently became an important center of Classicism (fig. 1).

A University had been established in Gundishâpâr by Chosroès in 555: here Syrians and Nestorians taught mathematics, science, philosophy and medicine, the latter based on classical medicine, especially the works of Galen. A great buying up of medical manuscripts was carried on by maecenathist Caliphs with the

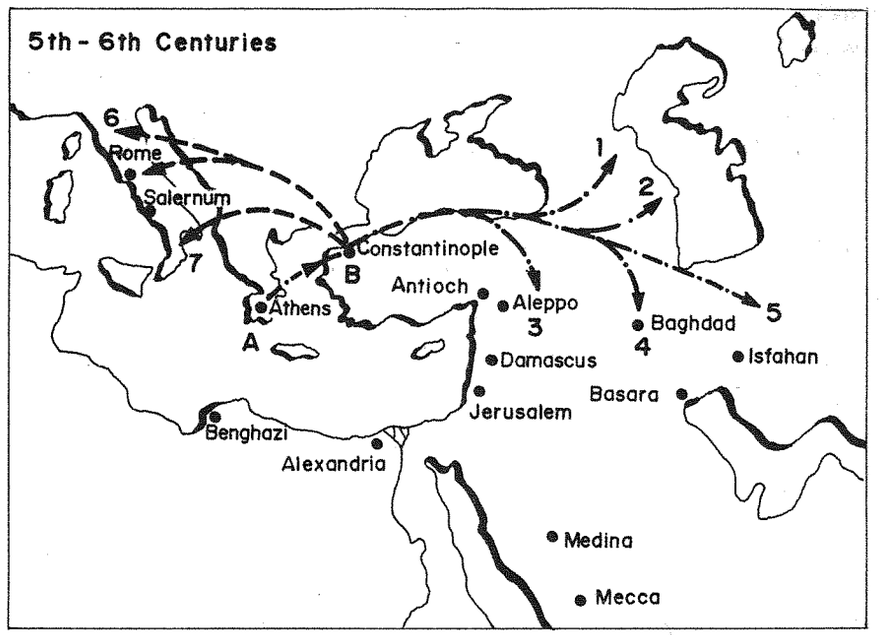


Fig. 1 — Map of Hellenic world and Middle-East, 5th-6th centuries A.D.

Emigration of philosophers of the Academy from Athens (**A**) and of Nestorians from Constantinopolitan area (**B**) to Middle-East.

—.—.—: 1. Georgia, 2. Armenia, 3. Syria, 4. Mesopotamia, 5. Gundishâpâr.
——— : peripheralization to 6. Ravenna and 7. Vivarium.

aid of experts, such as the deans of the Medical School or the House of learning[2].

In fact, during the Persian caliphate of Abbasids (750-1258) in Baghdad literature, philosophy and science were encouraged, under the auspices of the muslim *mutazilyte* doctrine, which holds that there is no contradiction between reason and revealed truth. The caliph al-Mámûn (813-833) opened the "House of learning" (*Bayt al-Hikmah*) in Baghdad (830 A.D.), with a celebrated library and a centre for translation from the Classics, which

were collected from the principal centres of the Hellenistic world. In this context should be placed the extraordinary work of translations of classical medicine by Hunayn ibn Ishâq, encouraged by Caliphs, so tremendous was their interest in philosophy and medicine. When Georgîs ibn Bahtîsû, sâhib (dean) of the Medical School at Gundishâpâr, successfully cured the Caliph al-Mansûr (765), he became physician at the Court of Caliph, a function transmitted from father to son, together with the office of chairman of the Caliph's hospital at Baghdad.

The last great change regarding the transmission of writings was made by the introduction of paper instead of parchment: the Arabs took this invention from China. The most ancient Arabic manuscript on paper is dated 866 and the new material in the Byzantine world was called *Bagdatikós* (that means "of Baghdad") or *Bambúkinos* (from Bambykè or Hiérapolis, a town between Antioch and Edessa and center for the paper trade).

This was the substrate for the transmission of Classical ideas and works, mainly those of Aristotle and Galen, into the Arab world: even Hippocratic works were transmitted in Arabic because quoted by Galen and sometimes recovered as *lemmata* found in the *Commentaria* of Galen as "Hippocrates says ...".

Because the around twenty books of the *Corpus Hippocraticum*, were present in very ancient Arabic manuscripts, and they are older than most ancient Greek manuscripts (i.e *M* 269 and *V* 276), Arabic manuscripts are the testimony of this process largely due to Nestorians.

It is worth noting that the studies in this field are generally undertaken to establish the original text or meaning of text and a current method of study is the comparison of Greek late classical with Middle-eastern manuscripts, regarding both texts and meaning (e.g. in this case about a disease). In fact the most important lateral source of information is the Syriac-Arabic transmission, which, regarding medicine, is mainly due to the work of Hunayn-ibn-Ishâq and his school[3].

The role of a transmission is relevant if faithful: the method followed by Hunayn is self-explained in a letter sent to Alì ibn

Yahyâ, friend and secretary of the caliph Al-Mutawakkil[4]. The letter is reported in ch. 3 of the *Risâlah* about the translation from Greek to Syriac of the Galenic treatise *De sectis*:

> *When I was about twenty years old, I translated the book from a defective Greek manuscript for a physician of Gunady-Sâbûr called Sirisu ibn Qutrub. Later on, when I was about forty years old, my pupil Hubays asked me to improve the translation, after having collected some Greek manuscripts. At this point I collected and compared these manuscripts until I had a single [Greek] true manuscript (*nishah wâhidah*); then I compared the Syriac manuscript and corrected it. This is my own method of work for all my translations*[5].

With this advanced critical and philological method, Hunayn and his school produced some hundred works, under the patronage of Nestorians when translated into Syriac or Muslims when translated into Arabic (few names of patrons of either one or another community are reported in the *Risâlah*). Thus, at the end of the 9th century, all principal treatises of classical medicine were available in both Syriac and Arabic. The transmission of this thinking spread to lands outside the Arab dominion: it has been supposed that elements of Greek medicine, which have been found in ancient manuscripts of central Asia, may be especially due to missions of Nestorians and Jacobites.

However, a fragment of a paper-manuscript of the 9th-10th century, studied by Riccardo CONTINI (Meeting, ref. 1), seems to have been transmitted by missions of Nestorians. The manuscript is full of blanks, but the fragments clearly show that it is a part of a Syriac prescription-book, ordered according to the different parts of the human body from head to foot: this is a typical order of popular Syriac medicine, following the initial phase of the teaching of Galen (*Galeni De compositione medicamentorum secundum locos*, Kühn XII, 378-1007; XII, 1-361), then changed by the Galen himself, who followed an aetiopathogenetic criterion (...*per genera*, Kühn XIII, 362-1058). The beginning describes the therapy against hair loss or alopecia, then remedies against hirsutism: the scientificity of

the text is demonstrated by drugs (laudanum, cantharis, etc.) corresponding to the therapeutic doctrine of Pliny, Dioscorides and Galen, which is classical medicine, filtered through the Syriac-Arabic transmission: the text is closely related to a few passages of Avicenna, who was active only a few years later.

Since the 10th century Syriac fell into disuse as a scientific language, so that only the Arabic versions have come down to us. We may ask if a corruption of the original text occurred during the translation: when both Greek original and Arabic versions reached our time the comparison may be made easier and sometimes it is possible to establish the original text by studying the transmitted works. This is the case of *De superfoetatione* (Littré VIII, 476-508), a hippocratic treatise recently edited by C.D. Lienau (6)): the translation from the Arabic into English by J.N.Mattock (7) enables us to correct the text edited by Lienau based on the Greek Codices, because early Arabic versions reported variants, which agree with the general meaning of the text much better than those accepted by Lienau[8]. This indirect philological method (interpretation of an original Greek text by using the Arabic versions) should be used carefully and applied with caution, even if the principles of the so-called negative apparatus cannot be used, because the Syriac intermediate translation cannot be found[9].

Recovery of lost Greek texts through Arabic versions

There are lacks in our knowledge of ancient literature and science, due to the loss of many texts: the hope is that much can be rediscovered through their translations in various Oriental languages, mainly Arabic. In fact, classical philosophy and medicine have been the most important foundation of Arabian medicine, including teaching in the Medical Schools. Thus, it may be that of a lost treatise (or partially lost or of uncertain attribution) we have more than one Arabic version. This is the case of the Aristotelian *Problemata Physica* in Arabic (*Pro-*

blemata Physica Arabica), of which a larger copy than those hitherto available has been recently found in Meninseni (Turkey) by Lourus S. FILIUS (Meeting ref. 1). A passage on frequent sexual intercourse, which damages eyes and buttocks, due to the occurrence of many moistures , is useful for comparison with the Greek original (*Problemata Physica Graeca*). In the widespread Arabic version (550 A.D) many alterations (i.e. deletions: ch. 4.29) may be found: like a genetic disease, the changes are due to the dominant "Galenic" character, because of the influence of him. Were these changes made by Arabs ? The analysis of the text regarding logic and style suggests that the Arabic passage may be useful as a *vetustissimo codex* for studies about authenticity.

The discovery of a lost treatise is very unusual, because a large work of revision of Libraries of ancient manuscripts was carried on till the last century and some surprises may be expected only from the Arab world. In fact, only on exceptional occasions has it been possible to recover a text which has been lost in the original language. This is the case of a work of Galen on sleep and wakefulness, studied in the Arabic text by MATTOCK in the manuscript *Aya Sofya* 3725 fol. 73a-79a[10].

The Arabic title adds "and on emaciation", which is very strange in that the word does not occur in the text as a chapter and only twice as a word. The work may be dated to the XI century: the small treatise aims to present and discuss sleep and the three causes of troubles related to it. The critical analysis of the thesis of the text is very important for the attribution and evaluation of authenticity.

In this case the regulation and troubles of sleep agree with the general principles of Galen. Sleep is regulated - the manuscript says, according to MATTOCK - by three causes. They are moistness of the brain, the width of its channels and finally the easy flow of the natural sweet matter, from which and by which comes the substaining of the brain and on which it feeds the other parts of the body. Soporific foods, drunkenness and fatigue may modify these three natural causes of modulation

of sleep. The brain needs cold in opposition to the heat of the heart, natural moistness, so that it does not dry out and waste away from the movements that come from it and by it. When the substances of the brain proliferate, a "silent disease" occurs, which is clearly different from epilepsy.

The last part of the work treats awakening and the ways it occurs naturally or can be induced after falling to sleep. Awakening - the Author says - is due to the production of an unbalance of the channels of the brain and it may be induced by a moderate voice because it is suitable for the channels of brain, whereas a loud voice widens the channels. This theory recalls the ideas of Asclepiades and his theory of fluxes of atoms through the channels of the body, a theory which quickly disappeared[11].

Another extraordinary case of recovery of a manuscript lost in the Greek original is that of a *Commentarium* by Galen on the Hippocratic *De äere aquis et locis* (Littré II, 12-93), which was found in 1970 in the National Library of Cairo in the Collection *Tal'at*, manuscript *tibb* (that is "medicine" in Arabic) 550 (12). The manuscript also reports the Arabic version of the Hippocratic treatise *De äere*, translated from Greek by Hunayn. Until the discovery, Galen's commentary was known only in a very short version and we look forward with great interest to the complete edition, which is in preparation by Gothard STROHMAIER[13]: maybe this is the very rare case of the recovery of an original text by a faithful translation. Of this treatise by Galen we have the above mentioned Arabic version and incomplete translations from Arabic into Hebrew by Salomon ha-Meati and from this Hebrew text to Latin by Moses Amram Alatinus[14], whereas the original Greek Hippocratic treatise (*De äere aquis et locis*) is present in the Codex *Vaticanus gr.* 276, fol. 63v-67v. Thus, the Arabic version of the commentary may be compared to the Hebrew and Latin versions and Hippocratic treatise[12-14]. The Arabic manuscript is ascribed to the School of Hunayn ibn Ishâq: in particular the Greek-Syriac translation to Hunayn and the Syriac-Arabic version to his nephew Hubays ibn al-Hasan under the supervision of Hunayn,

following a method of "playing duets" described by Hunayn in his *Risâlah*[4]. May we consider the Arabic version faithful? The accurate philological method followed by Hunayn and the comparison with the Hippocratic work induce us to consider this an extraordinary case of a recovery of a manuscript lost in the original language. The only inaccuracy in the choice of words may be found, according to Strohmaier[13], in the identification of Greek proper names, which are sometimes difficult to render, because Galen, with his own pompous way of narration, introduced other elements., i.e. the quotation of some verses from Hesiod's *Opera et dies* or considerations about Roman concepts of astronomy, due to a quarrel regarding the exact timing of the equinoxes and the solstices. Galen had a training in mathematical astronomy, for which already his father had praised him, Galen says with his usual conceit: thus, he is able to solve the quarrel, to the astonishment of the Romans, because they have a poor mathematical knowledge and have a general inclination towards astrology with pretensions to tell the future life, e.g. of a child from the day of birth, a fact that Galen finds ridiculous and ascribes to the fact that Romans generally ignore the works of Ptolemy and of other astronomers[15], and only a few know Euclid (they asked Galen to compose a book - The Stars of Hippocrates and the Science of Geometry useful in Medicine -, which has been lost, because Galen did not keep another copy with him). Thus, the style of the Arabic version closely agrees with that of the physician of Pergamum and with the facts of his life. Finally, we note the accuracy of the Arabic text also in the parts of the commentary, which are four (airs, seasons, waters, places) instead of the three in the title of the Hippocratic treatise. But if we read the 1st chapter of *De äere*, we may observe that, in spite of the title, the subjects enunciated are four:

> *Whoever wishes to pursue properly the science of medicine must proceed thus. First he ought to consider what effects each season of the year can produce... The next point is the hot winds and the cold, especially those that are universal, but also those that are*

> *peculiar to each particular region. He must also consider the properties of the waters... Therefore, on arrival in a town with which he is unfamiliar, a physician should examine its position with respect to the winds and to the rising of the sun...* (De äere aquis et locis, *ch. 1.1-15).*

All the elements examined of the Arabic version of the lost commentary by Galen agree with both the general meaning and style of the Author and the Hippocratic treatise. Thus, it may be the last time in the history of philology that "such a huge text of antiquity will be brought to light again in its entirety", we note with Strohmaier: thus, apart from this exceptionally successful case, the main field of study is the interpretation of classical works by the *lateral route* versions.

Galen seems to be the central author in the developing tradition of classical-Arabian medicine and Hippocrates was translated in connection with Galen (e.g. the *commentarii* by Galen on Hippocratic works) more than because of any original interest. The written Arabic Canons of Hippocratic works contain only a third of the Hippocratic works listed in the *Souidas Lexicon* or collected in the *Codices antiqui Marcianus gr.* 269 and *Vaticanus gr.* 276: the Arabic Hippocrates contains the works used in teaching or necessary to understand the *commentaria* by Galen (*Aphorismi, Prognosticon, De aëre aquis et locis, De diaeta acutorum, De morbis vulgaribus-Epid.* I, III, II, VI, *De natura hominis, De humoribus, Vectiarius, De officina medici, Fracturis, De articulis, De ulceribus, De alimento, De genitura-De natura pueri* ordered together, *De morbis mulierum, De diebus iudicatoriis* and *Iusiurandum*). Because the Arabic manuscripts are more ancient than the Greek manuscripts (i.e. *M* 269 and *V* 276), the contents of the Arabic *Corpus Hippocraticum* and the order of books may be a useful marker to follow the formation of the same *C.H.* in the Western world (L.R. Angeletti, manuscript in press). In fact, Arabic manuscripts have been derived from a Greek archetype and the translation Greek-[Syriac]-Arabic have been faithfully made as in a *tabula rasa*, so that a comparison of meaning between supposed original and transmitted versions may be helpful.

Actually, a comparison between late Greek and Middle Eastern concepts of diseases (i.e. early Islamic medical authors) has been carried out by Lutz RICHTER-BERNBURG, who has analyzed the problem regarding both the so-called contagious and infectious diseases (16). He has pointed out that no distinction was made by Islamic medicine between various modes of transmission, which was considered due to a miasmatic alteration of the air. The period analyzed (from Galen to al-Râzi or Rhazes, 860-932 A.D.) and condition of ailments (smallpox, measles and bubonic and septicaemic plague, which are closely related in the Islamic sources, corresponding to the Greek *loimós*) cover a large possibility of analysis and we find a *retrojection* of current medical information into an ancient classical text (*Aphorismi* of Hippocrates and *Ad Glauconem de methodo medendi* of Galen (Kühn XI. 1-146), a possibility which may occur mainly when the Greek authors are ambiguous and vagueness of description allows any explanation centuries later (17). The current analysis made by medical historians, who are also physicians, may run the risk of arbitrary retrojections. Thus, interaction is called for between specialized fields, such as philology, classical history, paleopathology, current medicine, etc. It should be remembered that a dramatic advancement was made by philologists and classical historians during the 19th century. In fact, texts have been established in a way sufficiently reliable with respect to the original. Research in this century has focused on the medical interpretation of the texts or the comparison between Greek texts and those transmitted first through the languages of the Middle-east (Georgian, Armenian and Syriac), then through Arabic.

Transmission into Georgian

Evidence of an early link between Georgia and Greek culture may be found in both religious and secular life. The monastery of Iviron, founded in 980 on Mount Athos, was a highly impor-

tant centre of Georgian spiritual life at that time. The Georgian literature was enriched by many translations from Greek texts made by the scribes of the school of Athonite (dead 1065) at Iviron.

Georgian ancient medical writings were extensively studied only in the first half of this century, when the principal medical manuscripts were collected in three volumes edited by Lado Kotetishvili (1895-1940) in 1936, 1938 and 1940 respectively, as quoted by Michel VAN ESBROEK (Meeting, ref. 1).

Georgian medical literature is linked to the golden age of David IV the Builder (1089-1125) and Queen Tamar to King David XI (*Dauth-Khan*, XVI century), who opposed his brother Simon 1st, dethroned him and adopted Islam. David IV the Builder founded the monastery of Gelati, near Kutaisi, to became a second Jerusalem for all the East, a school of learning and new Athens. The established Academy of Gelati played an important role in the development of Georgian culture as a centre of translations from Greek and many Georgian manuscripts may be found today at the Institute of the Manuscripts of Georgia.

It is worth noting that until now no Latin or Arabic version of Greek medical works were available in Georgia. Thus, it may be assumed that no recent contaminations have been introduced in the reconstruction of ancient manuscripts. Nevertheless, some influence of Arabic texts is present in the Georgian manuscripts, because, as noted by Van Esbroek, the most ancient Georgian manuscript has a title in Arabic-like Georgian, *Saakimo cigni*, which means "The Book", from the Arabic-like Georgian rooth *sa-o*.

This ancient Georgian medical manuscript dating from the XIII-XIV century (*Saakimo cigni* Manuscript S-1274 of the Georgian Institute Manuscripts, Tbilissi) concerns general considerations (chapters 1-15), diseases of the head (16-52), eyes (53-73), ears (74-83), mouth and teeth (84-105), stomach and intestine (106-130), liver (131-139), kidney (140-148), urethra and bladder (149-155), sexual organs (156-165), breast and uterus (166-176), bones and rheumatism (177-219). It is worth noting

that the Georgian transmission is characterized by very high fidelity, so that it is useful for comparison with the supposed original text.

Medical thought in Georgia was stabilized for almost two to three centuries, as demonstrated by the 2nd manuscript edited by Kotetishvili (1936). The manuscript *Iadigar Daudi* (Q-270 of the Georgian Institute Manuscripts) means "The writings of David". Dauth-kan (King David XI), son of Louarsab the 1st, during his kingdom (1569-1578) stayed in Constantinople for two years, which he spent compiling a medical text, which is a summa of original transmissions of Greek medical writings, enriched by the knowledge taken from manuscripts that the Sultan allowed him to consult (David in his preface speaks of "numerous medical and scientific manuscripts", treating pathology and therapy of all diseases, their aetiopathogenesis, their symptoms and remedies). The preface concludes that the aim of the work is the recovery of theories of Greek sages and philosophers, as desumed from two *Tatare* books (a word derived from Iranian or Turkish language), called *The good therapies* and *The good news*.

David's text is divided in three parts, about medicine, diet and aetiopathogenesis of diseases (including therapy), respectively. This is a subdivision typical of classical medicine (i.e. present in the Hippocratic Oath), which bears witness to us of the derivation of Georgian medical thought directly from ancient Greek medicine.

In David's text diseases are treated in the following order: neurological disorders, diseases of the eyes, ears, teeth, mouth, throat, lung, heart, stomach and intestine, kidney, bladder and sex organs, bones and diseases by heat and cold, dermatological diseases. Finally, the last part of the text is dedicated to the bites of snakes and scorpions.

The 3rd manuscript edited by Kotetishvili (1940) is called *Uscoro karabadini*, which is *De materia medica* or "The exact pharmacopoeia" of Kananeli (No. H-21 of the Georgian Institute Manuscripts).

Other manuscripts (*Karabadini*, Catalog No. H 914, probably by Abraam, 11th century; other *Karabadini* books, uncertainly attributed) treat of natural sciences (e.g. astronomy) more than of medicine.

This collection of manuscripts and particularly the most ancient above mentioned shows that Hippocratic medicine and Galen are directly represented in Georgian medicine, with few influences by other Authors (such as Andromacos' teaching about snakes in the medical text of David XI). The analysis of both *Saakimo Cigni* and *Iadigar Daudi* shows a close link with the Greek-[Nestorian]-Syriac-Arabic tradition, as desumed by the names which are quoted, e.g. *Baqrati* (Hippocrates), *Rop'is* (Rufus of Ephesus, 98 B.C.-17 A.D.) *Galinos* (Galen), *Andromahos*, who is Andromacus, the physician of Nero, *P'olis* (Paul of Aegine), *Arbiasios* (Oribase, 325-403, physician of Julian the Apostate), *Hunayn*, who is Hunayn ibn Ishâq (*lat. Joannicius*), *Iohana*, who is Abû Zakarîyîa ibn Yuhanna ibn Mâsawayh (*Johannes Damascenus*, living in Gundishâpâr 777-857); *Muhamed Zakariasdze* or Muhammed ibn Zakarîyâ or Rhazès (865-926); *Isaq*, who is Isaac Judaeus (10th century). It is a gallery of Classical-Syriac-Arab-Hebrew medicine!

Classical medicine in Arabian Spain

Another way for transmission of classical medical texts is represented by the Arab dominion in North-Africa and Spain (fig. 2). This latter was the case illustrated by Albert DIETRICH about Arabic commentaries on *De Materia Medica* of Dioscorides (18), a text which was first translated into Arabic at Baghdad by an Arabic-Christian called Istifân ibn Bâsîl (or Stephen, a pupil of Hunayn, 9th century). Later on, other translations were made from both Greek or Syriac (i.e by the Nestorian doctor Bahnan ibn-Mousa ibn-Yousouf, 10th century, Manuscript arabe 4947, Bibliothèque Nationale, Paris), but with low accuracy, so that the text by Stephen was considered the standard edition

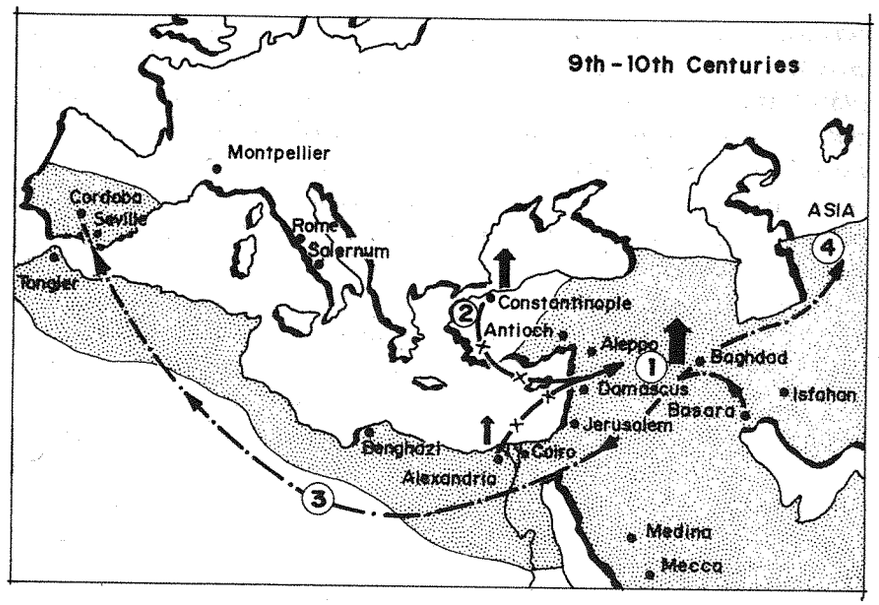


Fig. 2 — Map of Arabian dominions (grey dotted) with main cultural centers, 9th-10th centuries, i.e the time of transmission/translation (-x-x-x-) Greek-Syriac-Arabic (1), the Byzantine Renaissance (2) and transmission (-.-.-.-) of texts to North-Africa and Spain (3) and to Central Asia (by Nestorians, 4).

The height of the arrows shows current impulse to copy texts.

of pharmaceutical botany by Dioscorides and followed as a scientific text in the Arab dominions, including Spain. The only defects were related to the names of drugs or healing herbs and plants, which sometimes were difficult to translate from the Greek into Arabic, especially when unknown at that latitude. In fact, it is worth noting that Stephen has transliterated (and not translated) some untranslatable Greek names of herbs. Due to these shortcomings or misunderstandings stemming from unintelligible words about orginal terms, when the Caliph of Cordoba Abd-al Rahmân III set up diplomatic relations (948 A.D.) with the Emperor of Byzantium Constantine VII Por-

phyrogenete, a manuscript of *De materia medica* was an appreciated gift, also because accompanied by the monk Nicholas (950 A.D.), expert in both Greek and Arabic; Nicholas translated the manuscript into Arabic with the help of six physicians. Their new Arabic version was highly accurate, especially as regards terminology of drugs and healing herbs: actually, it was the physician Hasdai ben Schaprût who translated the names of healing herbs and drugs with the aid of Nicholas.

Some *Commentaria* were written in the next years, three of them following the order of the treatise of Dioscorides (end of 10th century at Cordoba and 13th century at Seville and Malaga, respectively), differing from the Arabic tradition of alphabetical order or according to the disease for which the drugs are effective. At the beginning of each chapter of the original text by Dioscorides were reported the names of drugs in Greek and sometimes taken from other languages: this method occurs also in the three versions mentioned above (i.e. Greek *dáphne* = laurel, Arabic *al-ghàr* and Latin *laurus*). The extension of the Arabic dominion from the borderland of India and Central Asia to North Africa and Spain introduced new medical herbs and supplements to the Greek original herbal by Dioscorides were made, mainly in Spain: this fact is a testimony of the importance ascribed to the original *De materia medica*, a text which cannot be interpolated, but only supplemented.

Since the treatise *De materia medica* may be found in many true versions from the original Greek, editions are useful as a tool for the attribution of other works of the same Author, said A. TOUWAIDE, who discussed the problems derived from two books attibuted to Dioscorides (*Alexipharmaka* and *Thèriaka*). They are not present in the Arabic versions derived from Hunayn's translations into Syriac. Actually, three questions have been asked: i. is Dioscorides the author of the two books? ii. if not, who is the author? iii. any way, when were they written and why were they attributed do Dioscorides?[19].

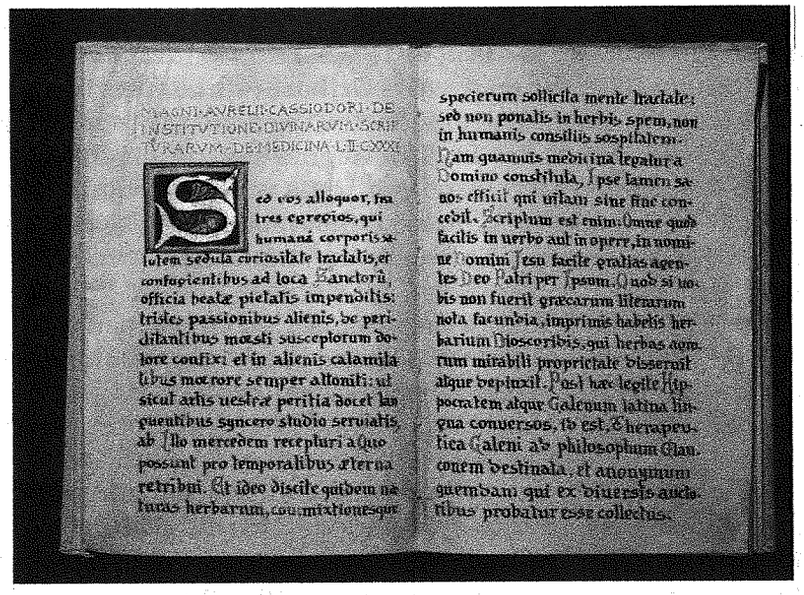
The comparison of *De materia medica* with the two books and the Greek texts with the Arabic version (mainly the division in

chapters) shows that we should differentiate the study of **sources** (e.g. philology, style or evolution of the language, etc.) from the **parallel route of transmission** (e.g. in the lost Syriac or in the now surviving Arabic versions) and, finally, from the structure and content of the work, e.g. the technical treatise *Alexipharmaka*, which may be compared to other works of Dioscorides (such as *De materia medica*) or to works on similar subjects by other authors, i.e. the epitomists Oribase (4th century) and Paul of Aegine (7th century), who collected the main subjectsof Greek medicine, not because - Paul of Aegine says in his *Proemium* - ancient Authors have forgotten some relevant points, but in order to have a pocket manual so that modern physicians, who accuse ancient medicine of verbosity, may know true classical medicine[20].

There is evidence that in the same period Greek medical texts were present in Ravenna (we have manuscripts about Hippocratic works translated into Latin, 6th century A.D.) or Southern Italy (at Vivarium, founded by Cassidorus, ca. 540 A.D.).

It is worth noting that in the Jewish tradition a theurgical view of medicine may be found in very ancient times (the time of Moses, *Leviticus* 12-15), whereas a positive evaluation of lay medicine may be seen later, as during the 2nd century B.C. in the Biblical book of Sirach (*Ecclesiasticus* 38.1-15), in which medicine is presented as a gift of God, but practised as an art. This is present in early Christianity at the time of Julian the Apostate: in his campaign for the revival of paganism, the Roman Emperor (361-363) prescribes the practice of medicine with a humanitarianism competitive with Christians (*Epistolae*, Paris, Bitez ed., 1924, 142-146). And when monasticism became an aggregation of persons devoted to sanctification by prayers and works, medicine as *donum Dei* is widely performed with a balance between art (*ars mechanica*) and science (*ars liberalis* in the nine liberal arts Canon of Varro; *secunda philosophia* for Isidorus, *Origines* VIII, 9.30), that is between practice and knowledge. Medicine in the Rule (*Regula*) of St. Benedict (6th

century) is a *donum Dei* and charity towards the sick a way to observe the general commandment of charity. Cassiodorus added the need of a theoretical study of classical authors (fig. 3), e.g. Hippocrates, Galen, Dioscorides and Caelius Aurelianus[21].


M. AVRELII CASSIODORI DE INSTITVTIONE DIVINARVM SCRIPTVRARVM DE MEDICINA LIBER XXXI

Sed vos alloquor, tres egregios, qui humanæ corporis salutem sedula curiositate tractatis, et confacientibus ad loca Sanctorum officia beatæ pietatis impenditis: tristes passionibus alienis, de peritiantibus mœsti susceptorum dolore confixi et in alienis calamitatibus mœrore semper attoniti: ut sicut artis uestræ peritia docet languentibus syncero studio seruatis, ab Illo mercedem recepturi a quo possunt pro temporalibus æterna retribui. Et ideo distile quidem naturas herbarum, commixtionesque specierum sollicita mente tractate: sed non penalis in herbis spem, non in humanis consiliis sospitalem. Nam quamuis medicina legatur a Domino constituta, Ipse tamen sanos efficit qui illam sine fine concedit. Scriptum est enim: Omne quod facitis in uerbo aut in opere, in nomine Domini Iesu facite gratias agentes Deo Patri per Ipsum. Quod si nobis non fuerit græcarum litterarum nota facunditia, imprimis habetis herbarium Dioscoridis, qui herbas nomum mirabili proprietate disseruit atque depinxit. Post hæc legite Hippocratem atque Galenum latina lingua conuersos, id est, Therapeutica Galeni ad philosophum Glauconem destinata, et anonymum quendam qui ex diuersis auctoribus probatur esse collectus.

Fig. 3 - *Regula* of Cassiodorus, the founder of Vivarium, Southern Italy (reproduction from an original manuscript, Museum of History of Medicine, Faculty of Medicine, University of Rome La Sapienza).

Despite the speculation and work of Cassiodorus, the influence of Vivarium on the spreading and development of classical medicine in Italy was limited, so that a more significant path of transmission of Greek medical thought in Western medicine is due to the relationship between North Africa and South-West Europe (mainly Spain and Southern Italy). In fact, classical medical thinking had renowned representatives in North Africa coming from other countries or native scholars of either Christian or Arab or Jewish origin (i.e. the epitomists Vindicianus,

4th century and his pupil Theodorus Priscianus; Caelius Aurelianus, 5th century; Alexander of Tralles, 6th century; Isaac Judaeus, 10th century; etc.). Again, trade between the two Mediterranean sea shores was very active without significant pause, mainly with Spain, Sicily and Salernum. This was the substratum on which Greek medicine flourished in the School of Salernum at the beginning of the 2nd millenium.

Hebrew Medicine

The role of Hebrew Medicine in the transmission of Classical medicine is due to two main sources, first in the Middle-East, then in Spain. Biblic and Talmudic medicine was essentially based on rules for hygiene, foods, sacrifice of animals by using jugular bleeding, inspection of animals to declare them *kashère* (eatable) or *téréfa* (uneatable), the examination of blood (which in western medicine occurs only after the discovery of the microscope), etc.. Talmudic medicine made advances in surgery by using the *samma deshinta*, which is a sleep-inducing drug (3rd century A.D.: Talmud of Babylone, manuscript *Baba Metzia*, fol, 83a); Caesarean section on living women is described in the treatise *khorot* 19, and reported in a Commentary by Rabbi Guerhom Méor Hagola (Metz, 10th century), whereas in western medicine the first case is of the 15th century (by the pork-butcher Nufer on his wife). Besides Talmudic medicine, there also existed a few Jewish professional physicians, such as Rufus the Jew, who was mentioned by Galen.

The first Hebrew writer of medicine was Assaph the Jew (Assaph ha-Yehoudi, 7th century A.D.), probably living in Palestine and author of a Book of drugs (*Séfer refouoth*), which contains parts of the Hippocratic *Aphorisms* and *Prognosticon*.

The influence of ancient Greek Hippocratic medicine may be seen in the selected Aphorisms, one like the Hippocratic first (life is short, art long...) and the beginning of the treatise, introducing the aim of the work, is: "This is the book, the treatise

of drugs...", which has been interpreted as a translation of works of other authors (22). Again the *Prognosticon* is translated from the Hippocratic text, as well as *De medici officina, De alimentorum facultatibus, De aëre, aquis et locis and De affectionibus* (Manuscript *Monacensis hebr.*, fol. 53, 55-56, 56-57 and 94-119, respectively). Only the Oath is widely enlarged as compared to the original Hippocratic text: we may note that the beginning contains a translation of the passage of the Hippocratic Oath against euthanasia and abortion, a passage that in the opinion of some was interpolated later: "Neither will you administer a lethal root-juice or induce abortion by drugs in a woman pregnant for adultery". If the Hippocratic meaning is well evidenced, the order of 24 healing herbs out of 123 that he describes is the same as in the original Greek Dioscorides: it is worth noting that Assaph describes the names of plants in Hebrew, Latin, Greek, Syriac, Persian and Arabic. He does not quote any Arab physician, thus indicating that at that time (6th-7th century A.D.) the great development of Arabian medicine was yet to come.

From about the 6th to 8th century Syrian Christian monks translated the works of Classical medicine, together with those of Aristotle (Elinor LIEBER, communication at the Meeting, ref. 1). When in the 9th century wealthy Christian and Muslim patrons commissioned the translations of medical works into Syriac and from the Syriac into Arabic, many Hippocratic and all of Galen's medical treatises existed in Arabic, including some that are still lost in the original Greek. From then on, the Jewish physicians of the medioeval Islamic world, like their Muslim and Christian colleagues, based their medical knowledge essentially on the writings of Galen and, through them, on the Hippocratic Corpus. This inter-faith inventory of Classical medicine was made possible by the fact that it was essentially not corrupted by theological considerations, because these centuries were characterized by a peaceful cooperation between different religious beliefs in a purely secular sphere. In fact, beliefs in Jewish medicine of that time closely agree with Nestorian or

Arabic medicine and only ethical books are written in Hebrew and not in Arabic, e.g. some ethical writings ascribed to Maïmomonides, some authentic, the others anyway going back to the same period (12th century) and offering a testimony of the origin of a tradition and meaning.

Classical medical speculation is fully present in the work of Isaac Judaeus (Abu Yáqub Ishâq Sulayman al-Israèli, ca. 850-950 A.D.), living at the time of the great development of Arabian medicine and Byzantine Renaissance. His books on Fevers, Urines and Regimen were translated from the original Arabic into Latin by Constantine the African and adopted in many European Universities: thus, to his conventional name is referred the Hebrew influence in the birth of the Medical School at Salernum. Actually, Constantine erroneously attributed to Isaac Judaeus books probably written by Haly Abbas. Like Assaph, Isaac Israèli was an author of ethical writings: the *Séfer Moussar Ha-Rofim* (Book on Ethical Medicine) is his only work in Hebrew. A great school of Jewish physicians grew up in Spain, with Avenzoar (ca. 1091-1162), Averroës (1126-1198) and Maïmonides (1135-1204).

They were philosophers and physicians, following Aristotle, Hippocrates and Galen, but also improving by a lay criticism the classical doctrines. If Avicenna believed that religion and Aristotelianism may agree, Avenzoar and Averroës condemned the mixing of religion and medicine: particularly the pantheistic thought of Averroës (which was opposed by both Muslims and Christian Orthodoxy) inflamed religious and political debate. The ethical field was developed later by Moses b. Maimon (Maïmonides, Cordoba 1135-1204). He emigrated to Palestine and Cairo, where he took up medicine as a career, becoming physician to the Court of Sultan Saladin. His writings contained prescriptions on hygiene, regimen (diet), general medical problems, ethics and a collection of aphorisms of Hippocrates and Galen, written in Arabic. He was famous also as a philosopher, following Aristotle, with the hostility of Orthodox Jews. The *Morning Prayer of the Physician* attributed to him but probably the

work of another author reflects his philosophical thought derived from the Stagirite (23). The works of Jewish-Arabs, treating classical medicine, were mainly written in Arabic and translated into Latin: paradoxically, due to their expulsion from Spain, is derived the spreading throughout Europe of their philosophical thought as well as of their classically-derived medicine. Jewish physicians and translators grew in the atmosphere of religious respect and scientific tolerance of Islam: their knowledge of Greek, Syriac and Arabic contribute to bring Greek writings into Arabic culture and, later on, into the Christian world by translations from Arabic to Latin. Thus, the Jewish persecution by the Almohades in Cordoba dispersed the great Arabic (and Abraic-Hebrew) culture, science and medicine to Europe, mainly Salerno and Montpellier, that gave a substiantial boost to the new foundation of classical medicine in the European centers of learning (fig. 4).

Classical medicine through Arab versions in Salernum

The documents collected by S. De Renzi (*Collectio Salernitana*, 5 voll., Naples, 1852-1859) and the Breslau Codex, found by Henschel and critically revised by Karl Sudhoff (24), allow an evaluation of the Medical School at Salernum. Sudhoff and his school (particularly R. Creutz) have critically revised many texts with great care, so that we may date the beginning of the rise of the medical tradition in Salernum as a school with the Benedictine monk and Archbishop of Salernum Alphanus, writer of Latin poems and Author of four treatises of medicine (25). During his episcopate there arrived in Salernum (ca. y. 1076), coming from Africa maybe with a stop in Reggio, Constantine the African, erudite in humanities, sciences and medicine, but not a physician or original author of medical works. In fact, he translated from Arabic to Latin Hippocratic treatises, two Arabian manuscripts (*Pantegni* of Haly Abbas and the *Viaticum* of Al Dschaafar) and the works of Isaac Judaeus on diet, fevers

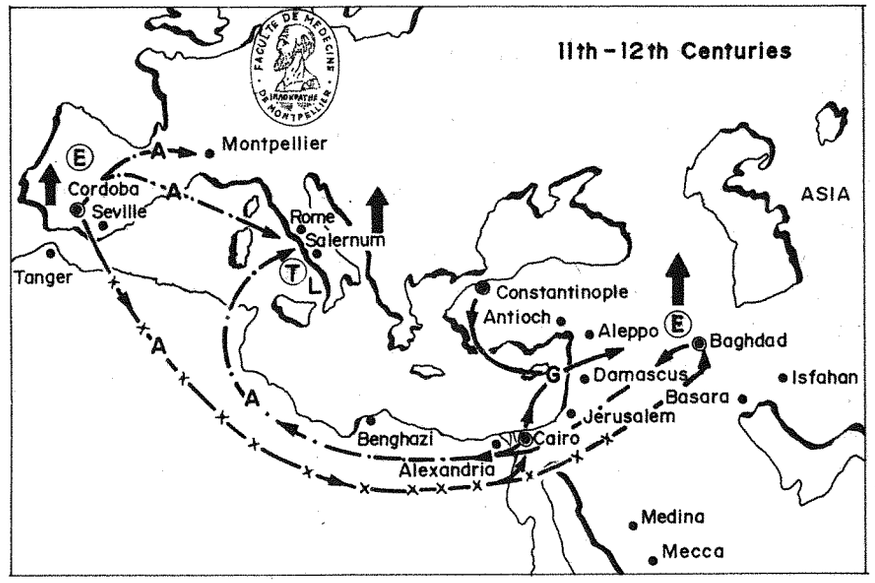


Fig. 4 — Transmission of Classical works between Constantinopolitan area, Arabian world and Europe, 11th-12th centuries.

The height of the arrows shows current impulse to copy or translate (**T**) texts and interpret and elaborate (**E**) the original texts and meaning (that is the possibility of corruption of texts).

———— : transmission of Greek texts to Middle-East area
x-x-x- : spreading of Arabic versions from Spain
—.—.— : transmission of Arabic versions into Southern Italy

G = Greek texts; A=Arabic versions; L = Latin versions.
In the circle are represented the arms of the University of Montpellier, showing the connection with Classical medicine.

and urine: he had a good knowledge of Arabic and Latin, but was less versed in Greek, so that he probably translated only from Arabic. He did not stop in Salernum for a long time and reached the Benedectine Cenoby of St. Agata in Aversa, then the Benedectine Abbey of Montecassino, where he worked as a

translator of medicine from Arabic to Latin until his death (ca. 1087). In fact, Constantine had tried a lot of Arabic books of Greek authors as well as of Isaac Judaeus or ascribed to him[26]. We may ask why Constantine was attracted by Salernum, says Enrique Montero Cartelle (Meeting, ref. 1): before him there was in that city a well known center of medicine, founded on practical activity, without any knowledge of that science - general and medical - which from Classical literature to the Syriac-Arabic translations had been highly developed by Arabic Caliphates since the 9th century. This culturally deficient situation in the presence of a medical school seemed attractive to Constantine, or perhaps owing to this situation somebody was sent to contact the erudite Constantine. It is worth noting that he was not directly related to the Medical School at Salernum (he lived in Montecassino): only during the 12th century did his translations become part of the compulsory teaching of the School.

Anyway, in Western Europe the knowledge of ancient Greek was dramatically lost after the 8th century (we do not have original productions of medical writings in Greek after the 6-7th century, thus indicating a loss of such an audience). To the decline of Western knowledge of classics corresponded an extraordinary development in the Arabian dominions, including North Africa, where medical works in the Arabic version were easily available, mainly at Cairo, where there was a famous hospital with a medical school. During the 9th century in Baghdad via Alexandria the translation of Greek classics was rendered with high philological quality, so that Aristotelian philosophy and Galean medicine became the foundation of Arabian culture. Thus, it is not linprising the recovery in Arabic of a lost Greek Freatise of Galen (fig. 5). Again, Constantine's translations were the fundamental way by which European medicine newly takes possession of the lost classical medicine, now enriched by the Arabs. In Salernum there is the first step of assimilation and receipt of Arabian medicine, not dependent on Sicily as intermediate.

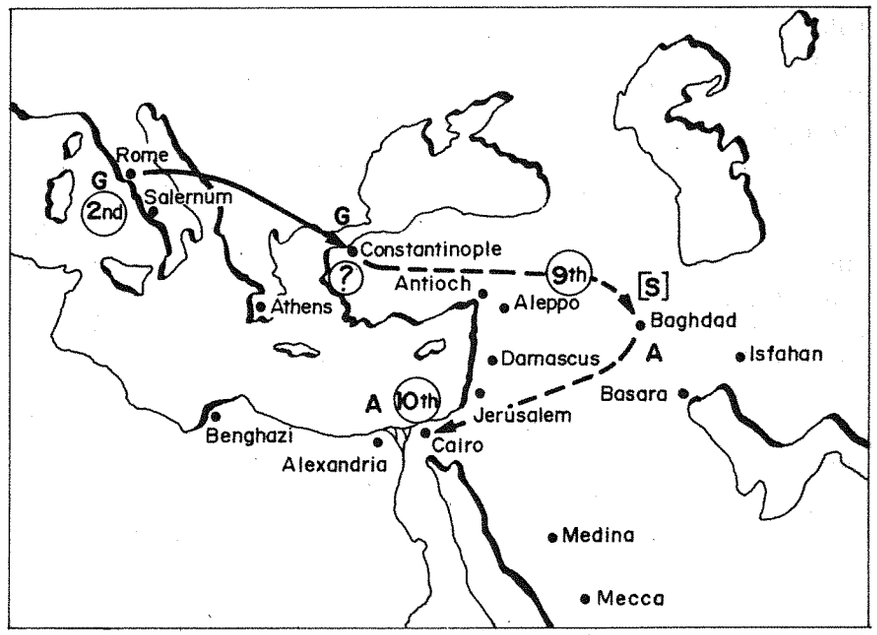


Fig. 5 — Recovery in Arabic of a lost Greek treatise, e.g. the *Galeni commentarium* on the Hippocratic *De aëre aquis et locis*.

In the circle are represented centuries of original editing and transmission (continuous line) and translation-Arabic transmission (dotted line). G=Greek; [S]= lost Syriac; A=Arabic.

The height of the arrows shows current impulse to copy (A) or translate texts and interpret and elaborate (B) the original texts and meaning (that is the possibility of corruption of texts). In the circle are represented the arms of the University of Montpellier.

Classical medicine in the Muslim and European world: a reverse process

We may ask what were the conditions in Alexandria and Baghdad which favoured the transmission of Greek culture. We know that in *Asklepieia* there was a coexistence of templar medicine and secular rational medicine, whereas the reciprocal

tolerance of Pagan times was not exerted in Alexandria by the Copts, who tolerated the Alexandrian School only because Christianized. Actually, this was an element of continuity, but did not favour the improvement of studies, because the Copts were hostile towards the Greeks and Greek culture. Gothard STROHMAIER (Meeting, ref. 1) quotes the legendary case of Geseus, a professor at Alexandria, who used to mock the Christian Sanctuary in the city. When he became ill, he was severely humiliated, asking for help in the sanctuary, before receiving care from the healer saints Cyrus and John: the legend reflects the hostility towards secular Greek culture, including medicine. A similar attitude was held by Orthodox Muslim theologians against Pagan medicine, so that only the upper class, the courtiers, merchants and landowners used Greek medicine.

Elements of continuity and discontinuity are mixed together, with the classical heritage fugitive from intolerance.

The compromise character of the Alexandrian School (of the School, not of the Copts!) as opposed to the orthodoxy of the Athenian Academy is the dominating fact in the history of philosophy and science in the 6th-7th centuries[27]: the Alexandrian School was Christianized in philosophy and medicine through the work of *Joannes Phylipon Grammatikós* (6th century), whereas in the same period in Palestine Theophan Graptos wrote an introduction to medical sciences and a *commentarium* on the *Analytica* of Aristotle (28). Thus, books of classical authors were available for anyone to buy in Alexandria in the 7th-8th centuries.

During the 9th century with the *mutazilyte* doctrine and the caliph al-Mamûn the general attitude changes, followed by the Muslim religion with the influential theologian Allah Hussan (died 1,111), whose authority has lasted until the present day. He made a distinction of remedies in three classes. The first class is represented by the most obvious, i.e. water against thirst and bread against hunger, corresponding to the will of God and nobody will refuse them. The second class is represented by less obvious remedies, like herbs and drugs, typical of medicine. The

third class corresponds to remedies which are based on magic and superstitions without relationship between cause and effect: the latter are forbidden by the pious Muslims. On these bases an extraordinary impulse was given by the reception of Greek culture, mainly philosophy and medicine, because there is no contradiction between religion and science, an acquisition made by the Christian Western world much later. When the Arabian dominion was spreading (6th-7th century) a contemporary lowering of the impulse for classical studies occurred in Europe, the Constantinapolitan area and Alexandria, with the maintainance of a **basal level** and a **peripheralization** of the centers of transmission of classical learning[29]. And when a new rise of learning occurred in Europe, Muslim culture declined and lost the receptivity so characteristic of its earlier epochs: the uncorrupted classical works were ready to come back to the lands of classicism.

Why these alternations of growth-decline and continuity-discontinuity? And why a reception without substantial corruption of texts and doctrine? Strohmaier quotes various theses, the failure of the humanism of the Greek mind to take root in an alien soil or the deep-rooted magic view of the world by Muslims opposed to the rationality of the European mind: since the 16th century the technological advancement of Europe (paper, textiles, handicraft products, etc.) has overflooded the Oriental markets with finished products. This is the reason for the rise of modern Europe, with a reverse process in the Muslim world.

But we should acknowledge that two main receptions of Greek science took place, each completely independent from the other, with its specific characteristics and deficiencies: one by the Romans in the Latin language, and the other, centuries later, by the Syrians and Arabs. There is a tendency for Western European civilizations to be considered the only heir of Greek-Roman culture: with regard to medicine and sciences, Greek culture was incorporated, with a faithful reception, in the Arabian world. Incorporated and also assimilated and elaborated again?

Probably only incorporated and assimilated. Galen himself, although celebrated, was regarded as a guest, with his untouchable doctrine, which was transmitted, but not discussed or changed. It is extraordinary and lucky the fact that in the various steps (from the Constantinopolitan area to Mesopotamia, from the Middle-East Arabian world to North-Africa and Spain, from these latter countries to France and Italy) the transmission occurred just **before** a critical development in literature and science in the same countries, as demonstrated by the rise of criticism of the doctrine of Galen or Aristotle, which occurred in the Muslim world during 11th-12th century, before the scientific revolution took place in European Universities (12th-14th century), but not in the first phase of the main reception of classical texts (9th-10th century): thus the Greek-Syriac-Arabic (9th-10th centuries) and Arabic-[Hebrew]-Latin transmission (10th-11th centuries) are the faithful images of the original, the invaluable pathway of continuity of classical thought.

Our current method of study is the search of the original text and meaning, the one closely related to the other, because during a passage from a language (i.e. Greek) to another (i.e. Syriac and Arabic) corruptions, mistakes, rearrangements, deletions, interpolations of the text may occur, in a way which is dramatically similar to processes which are described for transmission of genetic material: like a molecular biologist on samples of DNA, historians of medicine should apply this general rule to the analysis of a text, which may be considered a "genomic" library, so that a kind of *in situ* hybridization may be useful to compare the supposed Greek original with transmitted texts.

NOTES AND BIBLIOGRAPHY

[1] This group of research has been promoted first by Massimiliano PAVAN, Professor of Roman History at the University of Rome La Sapienza, Faculty of Humanities, who says:

It was a nearly trivial event to lead me to the idea of carrying out some research on the transmission of classical texts through the languages of the Middle-East. While working on my volume about the history of the Parthenon, I read a note in the still very useful book by Gregorius about Athens in the Middle Ages, which stated that the Georgian kings sent the young scholars to Athens in order to enable them to learn the Greek language and classical works. Afterwards, they had to bring some copies of them to their fatherland, where they were translated and therefore made intelligible for all the Georgian scholars. This was a clear important hint on the spread of the classical cultural heritage in the regions bordering the past Roman empire, which had now become the Byzantine empire. I immediately felt the need of learning more about it, so I contacted my colleagues who were experts in Eastern languages. From the first moment we realized that this field of research, although huge, was of extreme interest. We had to face two different kinds of problems: first of all we had to check the possibility of finding eastern translations of fragments, and sometimes of even entire works, which went back to copies prior to those received, thanks to the Greek-Byzantine codes; secondly we had to evaluate and to concretely attest how the classical heritage survived and spread not only outside the ancient world, beyond the old borders, but especially also in the Eastern areas, including the Coptic and the Ethiopic ones. Further on we had, also, to take into consideration another factor: the role played by Christianity, which had a great influence on the transmission of classical culture. In fact, Christianity built its own system of thought thanks to classical culture and languages - Greek and Latin-, and in this way was able to spread to other linguistic areas. In this framework, the consideration of another culture also turned out to be very useful: Paleoslavic. This was also effected by classical civilization, because of the circulation of the ecclesiastic texts present in the court of Byzantium. For the promotion of this work I must thank my colleague Umberto Cozzoli, professor of Greek history, for his cooperation. Similarly to me, he felt the great importance of this new knowledge not only from a philological point of view, but also from the more general cultural point of view. The diacronic transmission during the passing of time integrates and crosses with the synchronic transmission, whose core was the Mediterranean area. Here, as a result of new political establishments, especially with regard to the Arabic countries, the Eastern languages actually gave back to Western civilization several texts and works of its ancient culture which would have been, otherwise, considered lost forever. (Istituto Italiano per gli Studi Filosofici, Special Issue No.2 about cultural activity, 1988, p. 44).

The idea of Pavan was that, despite the fall in the study of Greek and in the reading of classical works in Latin since the century of St. Augustin (354-430 A.D.), a violent attack on the Classics occurred following the rise of Christianity, because the Christian revolution and its idea of transcendency refused the Greek-Roman world. Classicism - Pavan says - is derived from [social] **class** and the first class (or classification of best students) was extended to the school, where students were classified according to their *census* and *secundum vires ingenii*. Thus, Classicism was a sign of absolute individual qualities, transmitting values, historical values (*mos maiorum*) and theoretical values

philo-sophia), so that the indictment of the classical world by Christianity ended in its confluence into Christianity with an identification and an assimilation between ideal and natural meaning, between universality and individuality, between myth and *logos* [PAVAN M., Processo al classico. Fondamenti 1 (1985) 3-9], such as Pagan temples, which became Christian Churches. Thus, the way of transmission of classical works is closely bound to Christianity, with its apparent refusal and actual absorption of the Classics, an element of continuity for and by Nestorians, evu spreading to the Middle-East civilization and coming back into the Western world through Arabic, Hebrew and Latin. See: PAVAN M. and COZZOLI U. editors, L'eredità classica nelle lingue orientali, Roma, Ist. Enciclopedia Italiana, 1986 (Proceedings of Meetings held in Rome, 1983 and 1984); FIACCADORI G. editor, Autori classici in lingue del Vicino e Medio Oriente, Roma, Ist. Poligrafico dello Stato, 1990 (Proceedings of Meetings held in Brescia, 1984, Rome, 1985, Padua-Venice 1986).

Very recently, under the chairmanship of M. Pavan and U. Cozzoli, University of Rome La Sapienza, and G. Pugliese Carratelli and G. Marotta, Istituto Italiano per gli Studi Filosofici, an International Meeting was organized on TESTI MEDICI GRECI IN VERSIONI ORIENTALI (Greek Medical Texts in Middle-East Versions), Naples, November 6-11, 1990, and focused on the transmission of scientific works, mainly of medicine, with the following program:

STROHMAIER Gotthard, GRD Academy of Sciences, Berlin: Some Thoughts about a passage on the Romans in Galen's commentary on Hippocrates' *De aëre aquis locis*.
Van ESBROECK Michel, University of München: Les traditions médicales géorgiennes anciennes.
FILIUS Lourus S., University of Leiden: The place of the *Problemata Physics* in medical history. Some remarks as a result of the edition of the *Problemata Physics* in the Arabic translation.
LIEBER Elinor, Center for Postgratduate Hebrew Studies, Oxford: Maimonides' views on the trasmission of Galen's works to the medioeval Islamic world.
ENDRESS Gerhard, University of Ruhr, Bochum: Galien philosophe dans la tradition Arabo-islamique.
DIETRICH Albert, University of Gottingen: A propos des commentaires Arabes sur la matière médicale de Dioscoride.
TOUWAIDE Alain, University of Provence, Aix: Les deux traités de toxicologie attribués à Dioscoride en version Arabe: prolégomènes à une édition critique.
MATTOCK John N., University of Glasgow: Authenticity and attribution: an example of an Arabic text from a lost Greek original.
CONTINI Riccardo, University La Sapienza of Rome: Testi medici e altri scritti classici in Asia centrale per trafila siriaca.
RICHTER-BERNBURG Lutz, American University in Cairo, Center for Arabic Studies: Contagious fevers in late classical and early Islamic medical sources.
BAFFIONI Carmela, Istituto Universitario Orientale, Naples: Medici e medicine, magia e scienza e sapienza nelle *Rasáil* degli Ikhwân al-Safâ'.
MONTERO CARTELLE Enrique and HERRERO INGELMO Cruz, University of Valladolid: Costantino l'Africano e il recupero dei testi greci antichi di medicina.
HUGONNARD-ROCHE Henri, CNRS Paris: A propos de la réception de la logique grecque en syriaque.
FIACCADORI Gianfranco, University of Udine: Abrucalis/Empedocle.

GUTAS Dimitri, University of Yale, New Haven: The purpose and achievement of the Arabic commentaries on the *Organon*.
TAMANI Giuliano, University of Venice: La tradizione ebraica della *Rhetorica* e della *Poetica* di Aristotele.
SCHOONHEIM Pieter L., Zeeuwe Bibliotheek, Middleburg: Le catalogue des sciences naturelles selon Aristote et son influence sur le milieu arabe et latin.
BOLOGNESI Giancarlo, Milan: Lavoro in corso per l'edizione critica del *Progymnasmata* di Elio Teone (su testo greco e traduzione armena).
SAMIR Khalil, Beirut: Nouvelle contribution à l'étude du Némesius arabe.
SGARBI Romano, Milan: Il *De vita contemplativa* di Filone. Contributi alla critica del testo greco tramite la versione armena.
BUSI Giulio, Venice: I lapidari ellenistici nella tradizione ebraica medievale.

[2]LEMERLE P., *Le premier humanisme byzantin*. Paris, Presse Universitaire de France, 1971; GABRIELI F., *Gondishâpâr*. Enciclopedia Italiana 17, 1933, p. 533.
For the Arabic medicine see: LECLERC L., *Histoire de la médecine arabe; exposé complet des traductions du Grecs; les sciences en Orient, leur transmission à l'Occident par les traductions Latines*. Paris, Leroux, 2 voll., 1876.
MEYERHOF M., *Science and Medicine*. In: ARNOLD T. and GUILLAUME A. editors, *The Legacy of Islam*. Oxford, Oxford University Press, 1931, pp. 311-355.
HAMARNEH S., *Development of Hospitals in Islam*. J. History of Medicine and Allied Sciences 17 (1962) 366-384.
VÖÖBUS A., *History of the School of Nisibis*. *C.S.C.O.* (Louvain) 266 t. 26 (1965) 1-15.
ULLMAN M., *Die Medizin im Islam*. Leiden-Köln, Brill E.J. Press, 1970.
About hospitals in Syriac-Arabic area, it is worth noting that the first hospital was established by St. Ephraem (ca. 306-373 A.D.) in Edessa.

[3]Hunayn ibn Ishâq (Abû Zayd Hunayn ibn Ishâq ibn Sulaymân ibn Ayyûb al-Ibâdi) born in Hira, was active in the 9th century, under the Abbâsid Caliphate. Hunayn was a Christian of Syriac tradition (al-Ibâdi, which means "of the true God", is a nickname of Nestorian Christians), highly educated both in Syriac and Arabic, Persian and Greek about grammar and literature. Finally, Hunayn studied medicine in Alexandria and Gondeshâpur and practised in Baghdad (the new capital of Arab Muslims founded by the Caliph al-Mansur, 762 A.D.), where he died in 873. Regarding his life and work, see: GABRIELI G., *Hunayn ibn Ishâq*. Isis 6 (1924) 282-292, and MEYERHOF M., *New Light on Hunain ibn Ishâq and his period*. Isis 8 (1926) 685-724.
Hunayn, his son Ishâq ibn Hunayn and the nephew Hubays ibn al-Hasan translated Hippocrates and Galen , as seen in an ancient Arabic manuscript recently found in Istanbul and ascribed directly to Hunayn as *Risâlah* (which means Letters; manuscript Aya Sophya 3631, edited by MEYERHOF M., Al-asr maqâlat fî l-ayn, in: *The book of ten Treatises on the Eye ascribed to Hunayn ibn Ishâq*, Cairo Univ. Press, Il Cairo, 1928).
To Hunayn and his school are attributed some hundred works, mainly translated from Greek authors of medicine. Other scholars of the group of Hunayn were Istifân ibn Bâsîl, translator of *De materia medica* of Discorides, Isa ibn Yahyâ ibn Ibrâhim (quoted in the *Risâlah*), Mûsa ibn Hâlid and Yahyâ ibn Hârûn.

[4]SBAT P., *Le livre des "Questions sur l'oeil" de Hunayn ibn Ishâq*. Bull. Institut d'Égypte 17 (1934) p. 135.

[5]BERGSTRÄSSER G., *Hunain Ibn Ishâq und seine Schule*, Leiden, 1913, p. 5; reported also by MONTECCHI L., *Appunti per un'edizione diplomatica della traduzione araba del commentario di Galeno al Perì aéron udáton tópon d'Ippocrate*, in FIACCADORI G., 1990, op. cit., 179-187.

[6]LIENAU C.D., *Die Hippoktratische Schrift perì epiknesios-De superfoetatione, C.M.G.* I.2,2, 1973, Berlin

[7]*Kitâb Buqrât fî Habl 'alâ habl* (Hippocrates: On Superfoetation) edited and translated, with Introduction, Notes and Glossary by John Nicholas MATTOCK in: *Arabic Technical and Scientific texts*, vol. 3, Cambridge University Press, Cambridge, 1968.

[8]VON IRMER D., *Zur arabischen Überlieferung von [Hippokrates] De superfetatione.* Sudhoffs Archiv 63 (1979) 1-24.

[9]STROHMAIER G., *Der Arabische Hippokrates. Bemerkungen zu einem Aufsatz von Dieter IRMER.* Sudhoffs Archiv 64 (1980) 234-249. The article is a comment on a paper of VON IRMER D. on the same Sudhoffs Archiv (ref. 6).

[10]Galen's treatise on Sleep and Wakefulness, Arabic version: Aya Sofya 3725 fol. 73a-79a in: ULLMAN M., op. cit., 1970, p. 55: Über Schlafen, Wachen und Abamagerung; Ritter-Walzer Arab. Übs, p.819.

[11]This point is clearly influenced by Asclepiades of Bythinia, who believed that the body, like the universe, is made of fundamental particles, the *ánarmoi ógkoi* (*atomi*, we say), which percolate through channels: a regular movement produces health, and an unbalance sickness. The recovery of this theory is very unusual, since we cannot find it in the following centuries (VALLANCE J.T., *The lost theory of Asclepiades of Bithynia*, Oxford, Clarendon Press, 1990).

[12]SEZGIN F., *Geschichte des arabischen Schrifttums*, III, Leiden, 1970, p. 37; NOJA S., *Un nuovo anello nella trasmissione della cultura classica attraverso l'Islàm: il manoscritto arabo del Commentario di Galeno ai libri perì tópon kaì aéron kaì udáton di Ippocrate.* Schede Medievali 6-7 (1984) 42-51.

More recently Ursula WEISSER has seen what the situation is in the relationship between the Arabic Galen and the transmission of Hippocratic works in Arabic; see WEISSER U., *Das Corpus Hippocraticum in der arabischen Medizin.* In: BAADER G. and WINAU R. eds., *Die Hippokratischen Epidemien*, Sudhoffs Archiv Heft 27 (1989) 377-408.

Works of Classical medicine in Arabic have been edited in:
Arabic Technical and Scientific Texts by the Cambridge Middle East Centre, Cambridge, Heffer, 1966-.

Corpus Medicorum Graecorum Supplementum Orientale I-III, Berlin, Akademie-Verlag, 1963-1970.

[13]STROHMAIER G., *Galen's Commentary on Hippocratés De äere aquis et locis.* The critical edition of Arabic version is in preparation for the series of the *Corpus Medicorum Graecorum*, Berlin, Akademie-Verlag.

[14]WASSERSTEIN A., *Galen's Commentary on the Hippocratic Treatise Airs, Waters and Places in the Hebrew translation of Salomon ha-Meati.* Israel Academy of Science and Humanities Proceedings 6 (1982) 185-303.

[15]SPEIER W.H. (quoted by G. Strohmaier, Meeting ref. 1):

Because of their lack of interest in scientific thought, the Romans must be held responsible for the deteriorated state of knowledge in Western Europe during the first Millenium of the Christian era, while, in the eastern Empire, Byzantine and Alexandrian scholars continued to study the original classics of Greek science, the compilers of the Latin West rummaged no further than the readily digestible *compilia* of the most recent predecessors.

[16]RICHTER-BERNBURG L.: the communication of Richter-Bernburg is very interesting, because it provides a comparison between diseases in both late classical and

early Arabic medical litterature. It is shown that, with the exception of the description of pestilence by Rufus of Ephesus, as reported by Oribasius, classical Authors were vague, e.g. Galen describing the pandemic pestilence in the period 165-179, and this vagueness is generally found in the subsequent commentaries, e.g. in Arabic authors. This general behaviour may be changed, Richter-Bernburg says, when advanced clinical experience and epidemiological observations require a rereading and interpretation of ancient authors.

[17]The risk is a retrojection of current medical knowledge, as documented by Richter-Bernburg in his presentation (ref. 1), but it is also arbitrary to refuse a new analysis of diseases described in classical works.

[18]The work of Dioscorides was most popular in ancient times and transmitted in both the Greek original and translations, i.e. in Arabic.

A complete ancient Greek manuscript on this subject is the manuscript prepared in Constantinople in 512 A.D. for Juliana Anicia, daughter of Emperor Anicius Olybrius, today in the Section of ancient manuscripts of the Österreichische Nationalbibliotkek, Wien.

Apart from the translations by Stephen, we have other translations from the Syriac version by Hunain into Arabic by Mahrân ibn Mansûr ibn Mahrân (12th century). Of this latter version we have two manuscripts, entitled Kitâb al-Hasa is, the *Meshed Damascus ar.* 1385/1965 and *Parisinus ar.* 2947.

About the Commentary to Dioscorides' *De materia medica* we have no complete original Greek manuscript: only a Greek manuscript *recentior* on this subject may be found at the National Library of Manuscripts at Istanbul and small fragments of the same subject are in manuscripts today kept in Madrid and Teheran. Thus, the Arabic text is useful to analyze the supposed Greek original.

[19]TOUWAIDE A., *L'authenticité et l'origine des deux traités de toxicologie attribués à Discorides*: I. *Historie de la question.* II. *Apport de l'histoire di texte grec.* Janus 80 (1983) 1-53.

[20]PAULUS AEGINETA, edidit I.L. Heiberg. I-IV, Lipsiae et Berolini in aedibus B.G. Teubneri, 1921 (*C.M.G.* IX, 1, 3-5).

[21]CASSIODORUS' *Regula*: *De ititutione divinarum litterarum*, chapter XXXI; *De monachis curam infirmorum habentibus*, *Patrologia Latina* (*P.L.*) LXX, 1146-1147. For a comparison, see the *Regula* of St. Benedict (*Regula Sancti Benedicti*), e.g. c. XXXVI *De infirmis fratribus* (edited by G. Penco, Florence, La Nuova Italia, 1958).

[22]SIMON I., *L'influence Hippocratique sur la médecine Hébraïque, surtout chez Assaph, Isaac Israèli et Maïmonide.* In: *La Collection Hippocratique et son rôle dans l'histoire de la Médecine* (Colloque des Strasbourg, Oct. 23-27, 1972, Univ. of Human Sciences, Strasbourg), Brill E.J. ed., Leiden, 1975, 275-289.

[23]God, let my mind be ever clear and enlightened. By the bedside of the patient let no alien thought deflect it. Let everything that experience and scholarship have taught it be present in it and hinder it not in its tranquil work. For great and noble are those scientific judgments that serve the purpose of preserving the health and lives of Thy creatures... give me the strength, the will and the opportunity to amplify my knowledge more and more... in the patient let me see only a man... stand Thou by me in this great task, so that it may prosper. For without Thine aid man prospers not even in the smallest things... (MAIMONIDES, *Ethical Writings of Maimonides*, Dover Pub. Inc., New York, 1975).

[24]SUDHOFF K., *Die Salernitaner Handschrift in Breslau*. Archiv für Geschichte der Medizin 12 (1920) 101-148; SUDHOFF K., *Salerno, eine mittelalterliche Heil- und Lehrstelle am Tyrrhenischen Meere*. Archiv für Geschichte der Medizin 21 (1929) 43-62.

[25]Medical works of Alfanus of Salernum, monk at Montecassino and Archbishop at Salernum (1058-1085) are:

Premon physicon seu stipes naturalium, which is the Latin translation of the treatise *De natura hominis* of Nemesius of Emesa and edited by C. BAEUMKER, Die Übersetzung des Alfanus von Nemsius *perì phúseos anthrópou*. Wochenschrift für klassische Philologie 13 (1896) 1095-1102.

De quattuor humoribus, edited by P. CAPPARONI, *Il trattato De quattuor humoribus di Alfano I, Arcivescovo di Salerno*. Casinensia 1 (1929) 151-156.

De pulsibus, critical edition by R. CREUTZ, *Der Frühsalernitaner Alfanus und sein bislang unbekannter Liber de pulsibus*. Sudhoffs Archiv 29 (1937) 57-83. Edited also by P. CAPPARONI (Rome, 1936).

For a general comment on Alphane and the rise of medicine at Salerno, see: WICKERSHEIMER E., *Note sur les oeuvres médicales d'Alphane, Archevêque de Salerne*. Janus 34 (1930) 273-278; CORNER G.W., *The rise of Medicine at Salerno in the Twelfth Century*. Annals of Medical History, new series 3 (1931) 1-16. The therapeutical trend of Benedictine monks may be seen also from the original works of Bertarius (*De innumeris remediorum utilitatibus* and *De innumeris morbis*).

[26]Constantine the African translated many works. A list of 23 books has been transmitted by Petrus Diaconus, who died ca. 1,140 (Petri Diaconi monachi, Liber de viris illustribus casinensibus, XXIII, in: *P.L.* CLXXIII, coll. 1034-1035.

According to Leo Ostiensis, quoted by S. De Renzi (vol. 1, p. 220), Constantine translated the following works:

1. **Pantegni** (all that the physician must know: tegni = **téchne**)
2. **Practica** (general practice)
3. **Graduum simplicium, librum duodecim**
4. **Diaeta ciborum**
5. **Febrium**
6. **De urina**
7. **De interioribus membris (De coitu)**
8. **Viaticum** (pocket medical book for travellers)
9. **De instrumentis**
10. **De stomachi et intestinorum infirmitatibus**
11. **De languore hepatis, renum, vesice, splenis et fellis**
12. **De his, quae in exteriori cute nascuntur**
13. **Expositinem Aphorismi**
14. **Librum Tegni** (*téchne ars*), *Megategni* (*magna ars*), **Microtegni** (*parva ars*), **Pantegni** (*Tota ars*).
15. **Antidotarium**
16. **Disputationem Platonis et Ypocratis in sententiis**
17. **De simplici medicamine**
18. **De Gynaecia**
19. **De pulsibus**
    Prognostica (*)
20. **De experimentis**

21. **Glossae herbarum et speciarum**
    Chirurgia (*)
22. **De oculis (De medicamine oculorum**, according to Petrus Diaconus).

Some books are quoted only by Petrus Diaconus (*) and not by Leo Ostiensis. In the XVI century nine surviving works were printed first in Basel (1536, printer Henricus Petrus), whereas **Pantegni** was transmitted through many codices.

For a list of the Hippocratic works in Arabic medicine of the 11th century, see: ROSENTHAL F., *An Eleventh-Century List of the Works of Hippocrates*. J. History of Medicine and Allied Sciences 28 (1973) 156-165. The list is taken from the 1st chapter of of a treatise entitled *Fî t-tatarruq bi-t-tibb ilâ s-saâdah* (On the progress to true happiness through Medicine) by Alî Ibn Ridwân (XI century), reported in the Istanbul Manuscript Hekimoglu Ali Pasha 691, fol. 121v-122r. Ibn Ridwân says that in past times he did not have access to the list (*fihrist* = Greek *pinax*) of the writings of the Hippocratic school, so that "I wrote to my colleague Yahyâ ibn Saîd to receive a list translated by him from Greek to Arabic...". The list of fiftyfive books is out of order and Ibn Ridwân suggests a classification useful for students, according to Galen's view, studying first *Qâtîtirîyûn* (No. 6 of the list), which is *The Physician's shop*, then the treatises regarding traumatology and deadly wounds (*Galeni in Hippocratis de officina medici commentarium*, edited by M.C. Lyons, *C.M.G., suppl. Or., op. cit.*, ref. 12, I, p. 100).

About the order of treatises and relationship with the formation of the *Corpus Hippocraticum* see: ANGELETTI L.R., *The origin of the Corpus Hippocraticum from ancestors to codices antiqui*: the *Codex Vaticanus Graecus 276*. Medicina nei Secoli, 1991, in press.

[27]WESTERNINCK L.G., *Philosophy and Medicine in Late Antiquity*. Janus 51 (1964) 169-177.

[28]SAFFREY H.D., *Le chrétien Jean Philipon et la survivance de l'école d'Alexandrie au VI siêcle*. Revue des Ètudes grecques 67 (1954) 396-410.

[29]KAZHDAN A. and CUTLER A., *Continuity and Discontinuity in Byzantine History*. Byzantion 52 (1982) 451-454.

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